

## CLIMATOLOGICAL DATA FOR AUGUST, 1911.

## DISTRICT NO. 4, THE LAKE REGION.

Prof. HENRY J. COX, District Editor.

## GENERAL SUMMARY.

The weather of August, 1911, in the Lake region does not present many features of sufficient interest so far as unusual occurrences are concerned as to require extended discussion. The averages of the various elements show few decided departures from normal values for the district as a whole, nor, indeed, for any considerable area within its confines. The distribution of precipitation, however, was locally very irregular in amount, because of conditions which developed a larger number of thunderstorms than ordinary for this period, especially over the southern and eastern sections. Temperature values were more seasonable during August than was the case throughout the three months immediately preceding, and the conditions with respect to sunshine, cloudiness, and wind were not far from the average.

The following table summarizes the chief features of meteorological interest in the various portions of the district:

Portions of States lying within district No. 4	Mean temperature.	Departure from normal.	Mean precipitation.	Departure from normal.	Greatest 24-hour precipitation.	Number of days.	Prevailing wind direction.			
							Precipitation.	Clear.	Partly cloudy.	
Minnesota.....	61.1	-1.7	4.33	+0.65	1.19	11	10	14	7	nw.
Wisconsin.....	66.3	-0.9	3.17	+0.12	3.03	8	17	10	4	sw.
Illinois.....	71.8	+0.6	4.91	+2.14	1.43	12	13	13	5	ne.
Indiana.....	70.7	-1.1	3.26	+0.21	1.84	9	16	7	8	sw.
Upper Michigan.....	62.2	-0.4	3.05	-0.02	2.53	9	14	10	7	w.
Lower Michigan.....	66.4	+0.1	2.69	-0.16	3.36	8	15	11	5	sw.
Ohio.....	71.4	+0.7	4.79	+1.95	3.12	9	13	11	7	sw.
Pennsylvania.....	70.0	+0.1	5.76	+2.50	1.46	14	6	15	10	s.
New York.....	68.0	+1.6	3.73	+0.67	2.83	11	12	11	8	w.
Vermont.....	67.2	+1.7	3.73	-0.45	3.00	10	13	9	9	s.

## TEMPERATURE.

The mean temperature for the month was below normal generally west of the eighty-fifth meridian, the departure reaching  $-1.7^{\circ}$  over the Minnesota portion of the district. To the eastward the temperature was above the seasonal average, the mean departure increasing to  $+1.7^{\circ}$  in the Champlain Valley, and to more than  $+3^{\circ}$  in the region along the middle St. Lawrence River. No heat or cold of exceptional severity, however, was experienced in any portion of the district. The daily mean temperatures at no time differed from their respective normals by more than  $12^{\circ}$ , and the departures were usually less than  $6^{\circ}$ .

With the exception of the extreme western sections, the temperature was above normal during the greater portion of the first 17 days of the month, the maximum heat occurring generally on the 1st over the New York and

Vermont sections, on the 10th over the area to the southward of Lake Erie and in northern Indiana, on the 6th-9th over the Lower Michigan Peninsula, and on the 15th throughout most of the remainder of the district. After the 17th the temperature was almost continually below the normal, the 20th, 21st, 27th, and 28th being the only days of widespread warmth, although at no time did the heat conditions cover all portions of the district.

The coldest weather of the month occurred in most sections on the 29th and 30th, although in some localities in Ohio and New York the first few days of the last decade marked the time of lowest temperatures. During the cool spell of the 29th-30th a few light frosts occurred in Shawano, Door, and Brown Counties, Wis.; Chippewa and Ingham Counties, Mich.; and in Clinton County, N. Y. The frost at Sault Ste. Marie, Mich., on the morning of the 30th, was sufficiently severe to cause considerable damage to garden truck, and some places in the vicinity of that city reported the formation of ice in exposed vessels.

The daily range of temperature was generally from  $17^{\circ}$  to  $22^{\circ}$ , except in the region to the south of Lake Erie, where the diurnal swing averaged only about  $14^{\circ}$ . The absolute range was  $72^{\circ}$ , from  $101^{\circ}$  at Berne, Ind., and Bucyrus, Ohio, on the 10th, to  $29^{\circ}$  at Stephens Mine, Minn., on the 23d, and at Thomaston, Mich., on the 29th.

## PRECIPITATION.

While there was a decided excess in the amount of rainfall occurring during the month over that section of the district south of Lake Erie, the average amounts received throughout the remaining portions of the Lake region did not greatly differ from the normal values.

However, there was much irregularity in the local distribution of rainfall, so that the averages shown in the table give no conception of the actual conditions at any one point. In the Wisconsin section the monthly amounts of precipitation varied from 1.56 to 5.54 inches; in upper Michigan, from 1.10 to 6.57 inches; in lower Michigan, from 0.16 to 5.50 inches; in the Ohio section, from 2.49 to 8.33 inches; and in the New York section, from 1.09 to 8.20 inches. These irregularities are explained by the fact that the bulk of the rainfall in the regions noted occurred during local thunderstorms, of which there were a greater number than is usual for the season; and, while there were but few that occasioned loss of life or serious damage to property, a number were accompanied by excessive precipitation in the localities visited.

Droughty conditions have prevailed in the valley of Lake Champlain since the beginning of 1911, the deficiency at the end of August being nearly 7 inches. The situation with respect to precipitation in the New York

section of the district has been but little, if any, less serious than that of the extreme east. The conditions of these sections are instanced by the following extracts from the reports of Weather Bureau officials:

The average precipitation for the section (New York) was below normal every month this year, except February and August, and, as nearly all of August was comparatively dry, it will be seen that the section has undergone the exceptional experience of practically six months of deficient rainfall. During this period streams have fallen to extremely low stages or dried up altogether, and crops and pastures have in some cases been nearly ruined.—*Mr. Wilford M. Wilson, Section Director, Ithaca, N. Y.*

Navigation on Lake Champlain has been seriously impeded during the month by low water. On the 1st the Champlain Transportation Co. discontinued its stop at Adams Landing, and on the 26th the landing at St. Albans Bay was eliminated from their schedule, on account of the low water. On the 9th the water level of the lake was 0.85 foot above low-water mark, and, notwithstanding copious rainfall during the last half of the month, the level continued falling until the 27th. Since that date it has been stationary at 0.60 foot above low-water mark.—*Mr. John K. Hooper, Local Forecaster, Burlington, Vt.*

#### MISCELLANEOUS.

**Severe storms.**—While, as stated previously, the number of thunderstorms was greater than usual for August, comparatively few were of exceptional severity with regard to wind and lightning. A few cases of loss of life and damage to property by lightning were reported, but the latter was in most instances merely nominal. In several localities in the extreme eastern portion of the district some damage occurred as a result of flooding of cellars and basements and the washing out of roads and streets, as a result of the excessive rainfall accompanying the heavier storms. On the afternoon of August 18 a local storm of true tornadic type, but of very small size, occurred in the vicinity of Canton, N. Y., a description of which, by the official in charge of the local office of the Weather Bureau at that place, is given separate setting.

**Fog.**—The month was, as a rule, quite free from fog. At Duluth, Minn., and at Oswego, N. Y., dense fog occurred on seven days, but elsewhere throughout the district there was comparatively little, except over the St. Clair River, where navigation was greatly impeded by its occurrence on the 3d, 4th, 5th, 14th, and 26th.

**Aurora.**—An aurora was observed at Escanaba, Mich., on the evening of August 23.

#### TORNADO NEAR CANTON, N. Y.

By Mr. W. J. BENNETT, Local Forecaster.

From the Weather Bureau office at Canton, N. Y., were observed at about 3.20 p. m., August 18, two very large clouds in the north, dark gray in color, almost black, with a streak of light-gray cloud between. This streak soon assumed a funnel shape. It is uncertain whether the actual beginning of the tornado was observed, or whether at this time the intervening cloud masses broke away and rendered it visible from Canton. The people in the vicinity of the place where it struck the earth say that it occurred a little earlier—shortly after 3 p. m. The funnel-shaped cloud, as viewed from Canton, soon became quite distinct, with several filaments of partially developed columns near by, and from the top of the funnel appeared to rise masses of frothy, white cloud. It appeared to revolve rapidly, in a counter-clockwise direction, and its lower part became greatly elongated, dipping down toward the earth. At times parts of it seemed to break off and drift toward the earth, appearing in the distance like little white threads. At no time while under observation did the tornado cloud appear to reach, unbroken, from the clouds to the earth. The funnel had grown considerably

thinner by 3.35 p. m., and it finally disappeared about 3.40 p. m. While under observation it drifted slowly from the north-northeast toward the northeast. It was constantly changing its shape and twisting from side to side, but its motion of progression appeared to be slow. No lightning appeared to come from the funnel cloud itself, but from the dark masses of cloud on all sides lightning was frequent and vivid. The color of the funnel was light gray.

At Canton the temperature dropped about 10° in 20 minutes, about the time the tornado was under observation. A slight fall (0.02 inch), followed by an equal rise in the atmospheric pressure, occurred at the same time. The highest wind velocity was 22 miles per hour from the west at 3.45 p. m. The wind was from the west until 4 p. m., changing then to the north, and to the northwest at 4.20 p. m. A slight sprinkle of rain fell from 4.03 to 4.05 p. m., and light rain began again at 4.15 p. m., becoming heavier between 6 and 8 p. m. In all 0.38 inch was recorded at the Canton station, but no hail fell. Much heavier rain is reported as having occurred at Ogdensburg, 19 miles to the west-northwest, between 3 and 4 p. m.

The tornado was reported as having done some damage out on the Bucks Bridge Road, about 4 miles from Canton, and on the afternoon of the 19th the writer drove out to investigate. No one had been injured, and it was found that the actual damage was slight, but many interesting things were learned about the storm.

The tornado was first seen from the James Coakley farm, near the northeastern boundary of Canton Township, about halfway between Canton and Bucks Bridge in a direction a little west of north. It passed southward through a cornfield, tearing up a few stalks and carrying them up into the air, but its path was narrow and the damage slight. On the edge of the cornfield it picked up some stacks of grain and tossed them about. The storm passed on, moving now toward the southeast, and tore off the top of a haystack, carrying the hay no great distance, but depositing it in the direction of its advance. It then crossed the road, broke off the top of an apple tree, and came within 75 feet of the Coakley residence. The only effect upon the house was to draw the soot and fire out of the kitchen stove and chimney. The soot and wood embers were drawn up in a column, which united with the funnel cloud.

The storm passed on to a shed to the south of the house, and tore off all the roofing paper from the roof. Bits of the paper were found nearly half a mile away, in the direction of the storm's advance and several hundred feet to the right and left of its path. Near the shed was a pile of boards, which seemed to be directly in the storm's path. These were taken up high into the air and spread over a pasture to a distance of 500 feet, many being broken in the fall. About 50 feet of the pasture fence was carried away, the rails going up in the air quite a distance.

Through the pasture and the fields the tornado moved in a southeastward direction, but left little or no trace, the ground being bare. Approaching the house of H. E. Eggleston, it curved toward the east and toward the house, tearing away a section of fence about 75 feet long in the rear of the house. The rails were carried into the air to a height estimated at 100 feet, and some of them were so large and heavy that a man could hardly lift one. A tree 10 or 15 feet to the south of a shed in the rear of the house was torn up with some of its roots, carried up higher than the house, and dropped between the house and the shed. The storm passed very near the house,

TABLE 1.—Climatological data for August, 1911. District No. 4, Lake Region.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.			
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.	Number of rainy days, 0.01 inch or more.	Number of partly cloudy days.	Number of cloudy days.				
<i>Minnesota.</i>																					
Cloquet.....	Carlton.....	800	59.8	86	15	30	29	48	3.49	0.90	0	8	14	7	10	nw.	S. B. Detwiler.				
Duluth.....	St. Louis.....	1,133	40	61.0	-3.9	85	15	42	29	32	3.02	-0.51	0.83	0	11	6	20	5	ne.	U. S. Weather Bureau.	
Floodwood.....	do.....	1,257	6	60.1	-0.7	87	20	29	23	43	4.06	-	1.08	0	7	13	6	12	nw.	M. H. Schussler.	
Stephens Mine.....	do.....	1,500	4	60.1	-0.7	87	20	38	29	37	5.40	-	1.09	0	16	11	17	3	w.	Oliver Iron Mining Co.	
Two Harbors.....	Lake.....	614	17	62.6	-0.7	90	15	38	29	37	5.45	+ 0.75	1.00	0	11	15	5	ne.	G. W. Watts.		
Virginia.....	St. Louis.....	1,434	17	61.8	-0.5	85	20	33	29	35	5.54	+ 1.72	1.19	0	16	8	16	7	nw.	Oliver Iron Mining Co.	
<i>Wisconsin.</i>																					
Appleton.....	Outagamie.....	795	10	69.2	+ 1.3	92	15	43	29	29	2.64	+ 0.29	0.97	0	10	19	10	2	s.	Wm. O. Thiede.	
Ashland.....	Ashland.....	647	20	64.6	-2.5	92	15	38	29	36	2.45	-0.69	1.07	0	8	22	3	6	ne.	Sam Wheeler.	
Bayfield.....	Bayfield.....	635	2	63.7	-	90	15	43	29	38	4.35	-	1.14	0	11	14	12	5	ne.	John P. Kiel.	
Cecil.....	Shawano.....	804	13	63.3	-0.6	90	15	40	29	34	2.73	+ 0.47	1.55	0	3	18	12	1	sw.	Louis W. Schmidt.	
Florence.....	Florence.....	1,293	20	62.7 <sup>a</sup>	-0.7	86 <sup>a</sup>	15	37	29	42 <sup>a</sup>	5.37	+ 2.17	1.66	0	5	21	6	4	n.	Fred S. Evans.	
Fond du Lac.....	Fond du Lac.....	800	25	67.3	-0.4	90	15	36	29	36	1.78	-	1.36	0.50	0	8	17	8	w.	Geo. W. Marshall.	
Grand River Locks.....	Marquette.....	770	15	66.6	-	94	15	33	29	37	2.99	-	1.02	0.72	0	10	25	4	2	sw.	Jerry Parkinson.
Green Bay.....	Brown.....	617	25	66.9	-0.1	90	15	45	29	37	1.56	-	1.54	0.63	0	8	21	8	s.	U. S. Weather Bureau.	
Iron River.....	Bayfield.....	1,096	25	63.6	-	88	11	33	29	37	3.14	-	0.95	0	10	24	1	6	w.	Winfield E. Tripp.	
Kewaunee.....	Kewaunee.....	590	2	65.4	-	87	17	42	29	33	2.44	-	0.90	0	6	19	5	5	s.	Eugene V. Kimball.	
Manitowoc.....	Manitowoc.....	616	60	65.6	-0.3	80	9	42	29	33	3.28	+ 0.29	1.94	0	7	13	14	4	se.	Johanna Lups.	
Menasha.....	Winnebago.....	764	14	68.8	-	93 <sup>a</sup>	7	44 <sup>a</sup>	29 <sup>a</sup>	32 <sup>a</sup>	3.67	-	0.57	0.61	0	25	24	2	sw.	Geo. T. Allanson.	
Menomonee Falls.....	Waukesha.....	842	2	68.8 <sup>a</sup>	-	93 <sup>a</sup>	7	44 <sup>a</sup>	29 <sup>a</sup>	32 <sup>a</sup>	3.67	-	0.76	0	9	14	14	3	sw.	Arthur H. Christman.	
Milwaukee.....	Milwaukee.....	681	40	68.6	-0.1	90	7	50	29	38	1.99	-	0.88	0.85	0	9	14	14	3	ne.	U. S. Weather Bureau.
New London.....	Outagamie.....	762	15	67.0	-1.0	91	15	38	29	32	3.15	-	0.18	1.12	0	6	15	10	5	ne.	August H. Pape.
Oconto.....	Oconto.....	590	20	66.2	-1.1	89	15	41	29	31	1.73	-	0.77	0.96	0	4	15	14	2	w.	Wm. K. Smith.
Oshkosh.....	Winnebago.....	744	22	67.9	-0.9	91	16	41	29	34	2.60	-	0.24	0.60	0	8	23	7	1	sw.	Evan Vincent.
Pine River.....	Waushara.....	900	16	66.8	-1.3	89	15	39	29	32	4.44	+ 1.46	1.20	0	8	12	16	3	nw.	Geo. H. Carpenter.	
Plum Island.....	Door.....	588	3	65.3	-	82	15 <sup>a</sup>	51	23	33	4.33	-	1.19	0	6	13	10	8	se.	Geo. C. Robinson.	
Plymouth.....	Sheboygan.....	843	1	67.8 <sup>a</sup>	-	89 <sup>a</sup>	15 <sup>a</sup>	44 <sup>a</sup>	29 <sup>a</sup>	34 <sup>a</sup>	4.81	-	2.20	0	10	16 <sup>a</sup>	9 <sup>a</sup>	5 <sup>a</sup>	se.	Paul O. Felpinne.	
Port Washington.....	Ozaukee.....	713	18	67.8	0.0	94	7	45	29	30	2.72	-	0.32	0.92	0	8	15	10	5	se.	Richard C. Kann.
Racine.....	Racine.....	633	14	69.4	-1.2	94	7	46	29	33	5.54	+ 2.50	1.52	0	9	22	5	4	ne.	Daniel Davis.	
Ripon.....	Fond du Lac.....	935	1	69.1	-	91	15	45	29	32	3.35	-	0.86	0	8	16	9	6	sw.	Ripon College.	
Sheboygan.....	Sheboygan.....	831	12	67.7	-1.3	91	9	45	29	32	4.83	+ 1.99	3.02	0	11	16	18	3	se.	Louis C. Meyer.	
Sturgeon Bay.....	Door.....	600	12	64.0	-2.2	87	15	38	30	33	1.96	-	0.63	0	6	16	14	1	s.	Adam N. Dier.	
Superior.....	Douglas.....	671	2	61.6	-	86	15	40	29	32	3.32	-	0.78	0	12	15	11	5	ne.	Edward B. Banks.	
Waupaca.....	Waupaca.....	857	16	66.5 <sup>a</sup>	-1.6	91 <sup>a</sup>	15	35 <sup>a</sup>	29	41 <sup>a</sup>	3.55	+ 0.14	1.32	0	6	12 <sup>a</sup>	10 <sup>a</sup>	8 <sup>a</sup>	sw.	James H. Flagg.	
<i>Illinois.</i>																					
Chicago.....	Cook.....	824	41	71.8	+ 0.6	92	16	59	24	20	3.72	+ 0.84	1.43	0	12	13	13	5	ne.	U. S. Weather Bureau.	
Highland Park.....	Lake.....							6.10	+ 3.43		1.35	0								Jesse L. Smith.	
<i>Indiana.</i>																					
Auburn.....	Dekalb.....	874	15	67.0	-3.3	93	10	42	29	37	2.80	-0.42	0.79	0	7	15	5	11	sw.	Mrs. Josie B. Kuhlman.	
Berne.....	Adams.....	849	2	72.4	-	101	10	47	29 <sup>a</sup>	34	4.86	-	1.84	0	10	18	6	7	sw.	Henry M. Reutter.	
Elkhart.....	Elkhart.....	801	9	72.6 <sup>a</sup>	-	94 <sup>a</sup>	10 <sup>a</sup>	48 <sup>a</sup>	30 <sup>a</sup>	33 <sup>a</sup>	2.69	-	0.90	0	9	16 <sup>a</sup>	6 <sup>a</sup>	8 <sup>a</sup>	sw.	Dr. Miles Medical Co.	
Fort Wayne.....	Allen.....	775	15	70.9	-0.2	97	10	47	30	31	2.91	-	0.38	1.00	0	12	10	12	9	nw.	U. S. Weather Bureau.
Hammond.....	Lake.....	598	20	72.2	+ 0.7	96	4	44	31	42	2.95	+ 0.70	1.65	0	5	16	10	5	sw.	Carson W. Whitney.	
Howe.....	Lagrange.....	886	6	69.6	-	96	10	42	30	33	2.82	-	0.93	0	6	22	2	7	sw.	James E. Zook.	
South Bend.....	St. Joseph.....	726	18	70.0	-1.7	92	10	46	29	31	4.21	+ 0.95	1.57	0	11	15	4	12	nw.	Henry H. Swain.	
Whiting.....	Lake.....	606	2	70.6	-	90	7	53	30 <sup>a</sup>	29	2.87	-	1.11	0	9	17	9	5	ne.	D. H. Boyd.	
<i>Upper Michigan.</i>																					
Baraga.....	Baraga.....	623	9	62.0	-1.9	94	15	39	28 <sup>a</sup>	49	1.51	-	0.29	0.79	0	14	2	15	w.	D. S. S. & A. Ry.	
Bogland.....	Ontonagon.....	1,300	1	62.5	-	87	15	36	23	39	4.70	-	1.85	0	10	17	13	1	w.	Frank McMonigal.	
Blaney.....	Schoolcraft.....																				
Calumet.....	Houghton.....	1,246	23	61.4	-0.8	80	13	44	29 <sup>a</sup>	22	2.64	-	0.29	0.79	0	14	22	4	5	w.	E. S. Grierson.
Chatham.....	Alger.....	875	10	60.0	-1.9	82	14	30	29	36	3.58	+ 0.41	1.24	0	13	13	11	7	n.	U. P. Experiment Sta.	
Deer Park.....	Luce.....	610	10	61.8	+ 0.3	85	14	36	30	30	3.58	-	1.62	1.24	0	2	18	3	10	s.	Mrs. Sara E. McGraw.
Detour.....	Chippewa.....	585	10	65.3	-	90 <sup>a</sup>	13	39 <sup>a</sup>	30	34	3.10	-	1.30	0	4	22 <sup>a</sup>	1 <sup>a</sup>	6 <sup>a</sup>	sw.	G. C. Reed.	
Eagle Harbor.....	Keweenaw.....	622	12	60.8	-1.5	79	13	42	29	34	2.26	-	0.61	0.90	0	6	17	7	7	w.	John Nolen.
Escanaba.....	Delta.....	612	38	63.4	-1.1	81	9	43	29	32	3.52	-	0.09	1.20	0	10	16	4	4	s.	U. S. Weather Bureau.
Ewen.....	Ontonagon.....	1,147	10	60.7	-0.8	85 <sup>a</sup>	16	35 <sup>a</sup>	29	36	2.41	+ 0.47	1.30	0	10	12 <sup>a</sup>	4 <sup>a</sup>	14 <sup>a</sup>	sw.	W. B. Hatfield.	
Grand Marais.....	Alger.....	610	10	63.2	+ 0.8	82	27	49	14	32	2.29	-	0.02	1.00	0	9	17	9	5	s.	Mrs. Lena Truedell.
Green.....	Ontonagon.....	622	0	67.0	-	85	15	52	11	23	3.25	-	1.19	0	8	15	6	10	sw.	T. A. Green.	
Houghton.....	Houghton.....	668	10	62.7	-0.9	85	15	44	29	37	2.17	-	0.70	0.86	0	15	11	9	11	w.	U. S. Weather Bureau.
Humboldt.....	Marquette.....	1,536	14	61.4	+ 1.6	85	15	33	29 <sup>a</sup>	30	1.10	-	1.39	0.35	0	19	3	9	9	w.	D. S. S. & A. Ry.
Iron Mountain.....	Dickinson.....																				

TABLE 1.—Climatological data for August, 1911. District No. 4—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.			
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Greatest in 24 hours.	Departure from the normal.	Total snowfall, unselected.	Number of rainy days 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.			
<i>Lower Michigan—Con.</i>																					
Bay City.....	Bay.	593	15	69.4	+ 1.1	92	5†	44	29	34	2.90	- 0.19	1.50	0	6	28	2	1	ne.	Pere Marquette R. R.	
Benzonia.....	Benzie.	832	15																Martin S. Joiner.		
Berlin.....	St. Clair.	22	68.0	- 0.2	93	6	34†	30	33	4.14	+ 1.33	0.98	0	13	2	27	2	sw.	R. O. Gould.		
Big Rapids.....	Mecosta.	906	15	66.5	+ 0.4	90	6	36	30	37	1.37	- 1.41	0.38	0	7	22	7	2	w.	Charlie Gay.	
Bloomingdale.....	Van Buren.	7	68.6			93	6†	42	29	34	3.48		0.87	0	11	26	2	3	nw.	John M. Haven.	
Cadillac.....	Wexford.	1,293	2	66.8		88	7	42	24	32	2.05		0.60	0	8	23	8	0	n.	Water & Light Co.	
Cassopolis.....	Cass.	903	10										0.86	- 2.02	0	30	4	27	0	w.	Michigan Central R. R.
Charlevoix.....	Charlevoix.	610	13	64.4	- 1.9	88	4†	42	30	36	3.69	- 1.86	0.92	0	8	20	6	5	sw.	Pere Marquette R. R.	
Charlotte.....	Eaton.	7	68.9			91	10	40	30	41	2.23		1.60	0	6	23	5	3	sw.	City of Charlotte.	
Cheboygan.....	Cheboygan.	611	21	62.5	+ 0.2	88	1	35	30	38	3.60	+ 0.57	0.82	0	7	21	3	sw.	E. A. Bouchard.		
Clinton.....	Lenawee.	830	21	71.2	+ 1.1	96	10	44	29†	37	2.90	+ 0.47	0.90	0	7	20	6	5	sw.	David Woodward.	
Coldwater.....	Branch.	984	14	71.0	+ 1.1	93	7†	43	30	37	3.40	- 0.66	1.77	0	6	23	4	4	s.	L. S. & M. S. R. R.	
Concord.....	Jackson.	6	69.3			97	7	41	30	38	4.72		3.10	0	8	21	9	1	sw.	W. N. Armstrong.	
Croton.....	Newago.	655	3	68.6		96	6	41	29†	36	1.27		0.33	0	10	4	26	1	sw.	G. R. M. Power Co.	
Detroit.....	Wayne.	730	40	70.6	+ 0.7	90	10	48	30	24	1.31	- 1.46	0.32	0	9	11	15	5	e.	U. S. Weather Bureau.	
Durand.....	Shiawassee.	799	4																H. J. Tobin.		
East Tawas.....	Iosco.	590	14	64.6	- 1.2	85	15	40	29	30	2.32	+ 0.02	0.80	0	7	25	5	1	sw.	Detroit & Mackinaw Ry.	
Eloise.....	Wayne.	640	14	70.6	+ 0.4	93	10	43	30	33	1.82	- 0.84	0.37	0	9	13	14	4	se.	John Gilmore.	
Flint.....	Genesee.	730	22	67.3	- 0.2	91	6	40	30	42	3.03	+ 0.46	1.10	0	9	12	13	6	w.	William L. Fisher.	
Frankfort.....	Benzie.	589	7	66.6		82	7	45	24	27	2.05		0.60	0	6	20	0	11	s.	Geo. Morency.	
Ganges.....	Allegan.	665	2	68.4		88	10	45	30	33	3.39		1.01	0	11	21	6	4	sw.	H. H. Hutchins.	
Gaylord.....	Otsego.	1,367	11	65.2	+ 2.5	86	3†	45	29	28				0	0	18	0	13	sw.	Michigan Central R. R.	
Gladwin.....	Gladwin.	794	15	68.6	+ 2.5	93	6	40	29†	42	5.50	+ 3.11	1.40	0	6	25	4	2	sw.	Geo. R. Smith.	
Grand Haven.....	Ottawa.	628	30	66.8	- 1.0	87	10	46	30	27	1.20	- 1.38	0.50	0	8	14	14	3	sw.	U. S. Weather Bureau.	
Grand Rapids.....	Kent.	707	22	69.4	- 0.6	92	6	45	30	28	2.29	- 0.30	0.87	0	10	9	15	7	w.	Do.	
Grape.....	Monroe.	625	21	71.0	+ 0.9	90*	6	45	29	31	2.56	- 0.06	1.06	0	11	17	10	4	sw.	Joseph W. Morris.	
Grass Lake.....	Jackson.	959	5	69.9		96	10	43	29†	36	2.24		0.61	0	8	22	5	4	w.	Menzo Conklin.	
Gravilling.....	Crawford.	1,147	21	63.9	- 0.3	87	5†	30	17	45	1.64	- 1.27	0.60	0	9	13	13	5	nw.	S. N. Insley.	
Harbor Beach.....	Huron.	635	23			90	9				2.97	+ 0.37	0.95	0	6	24	5	2	s.	Pere Marquette R. R. Do.	
Harrison.....	Clare.	1,159	18																sw.	D. W. Mitchell.	
Harrisville.....	Alcona.	616	27	64.6	- 0.7	90	9	43	30	34	2.49	- 1.06	0.97	0	10	11	15	5	sw.	Pere Marquette R. R.	
Hart.....	Oceana.	698	19					45	26		1.95	- 0.52	0.80	0	4	20	7	4	sw.	C. F. Liepprandt.	
Hayes.....	Huron.	620	21	67.7	+ 1.2	90	6	42	30	34	3.91	+ 1.31	1.12	0	9	13	14	4	n.	A. D. De Garmo.	
Highland.....	Oakland.	830	19								1.30	- 1.05	0.60	0	7				sw.	C. L. Herron.	
Hillsdale.....	Hillsdale.	1,150	14	69.0	+ 0.1	94	6	42	29	36	4.14	+ 1.66	2.01	0	7	15	8	6	sw.	City of Holland.	
Holland.....	Ottawa.	610	5	67.8		92	26	42	30	45	1.79		0.51	0	9	14	17	0	sw.	Frank Sharp.	
Howell.....	Livingston.	924	19	68.5	+ 0.6	91	9†	40	30	36	3.43	+ 0.81	2.40	0	7	15	10	6	sw.	O. L. Giddings.	
Ivan.....	Kalkaska.	22	66.0	+ 0.8	89	6†	37	24	38	2.58	- 0.29	0.74	0	12	10	21	0	w.	City of Jackson.		
Jackson.....	Jackson.	927	14	70.4	- 0.4	95	6†	41	29	40	2.44	+ 0.26	0.55	0	10	12	16	3	w.	William Bice.	
Jeddo.....	St. Clair.	667	22	68.8	+ 0.9	93	7	43	30	33	1.88	- 0.99	0.75	0	6	16	10	5	sw.	Kalamazoo Asylum.	
Kalamazoo.....	Kalamazoo.	955	35	70.6	+ 0.7	95	18	40†	29	37	3.08	+ 0.36	1.23	0	7	14	14	3	sw.	U. S. Weather Bureau.	
Lansing (Agr. College).....	Ingham.	820	47	68.2	- 0.4	93	6	40	30	38	1.48	- 1.38	0.51	0	9	11	13	7	s.	State board of health.	
Lansing (Capitol).....	do.	881	24	70.0	+ 1.5	93	6†	42	30	37	1.69	- 0.90	0.72	0	9	9	8	14	sw.	Michigan Home.	
Lapeer.....	Lapeer.	827	12	69.8	+ 2.9	92	9	35	30	42	2.51	+ 0.21	1.05	0	8	22	0	0	sw.	Pere Marquette R. R.	
Ludington.....	Mason.	556	13	66.0	- 1.6	87	7	42	24†	33	3.27	+ 1.37	1.35	0	5	26	5	0	sw.	John W. Nicholson.	
Luther.....	Lake.	1,028	1	66.0		94	6	35	29	37	3.24		0.97	0	11	8	21	2	w.	G. R. & I. Ry.	
Mackinaw.....	Cheboygan.	592	15	64.8	- 0.8	86	27	33	30	38	2.07	- 1.95	0.80	0	6	18	9	4	n.	Do.	
Mancelona.....	Antwerp.	1,121	15	66.0	+ 1.5	88	7	39	24	36	0.89	- 1.44	0.30	0	6	24	6	0	sw.	Pere Marquette R. R.	
Manistee.....	Manistee.	600	14	68.2	+ 3.2	91	1†	43	24	31	3.51	+ 1.26	1.40	0	8	26	5	0	s.	George J. Tripp.	
Midland.....	Midland.	604	12	69.6	+ 0.7	98	6†	41	30	44	1.10	- 0.98	0.50	0	4	17	8	6	sw.	Pere Marquette R. R.	
Morenci.....	Lenawee.	811	4	69.8		92	10	46†	30	33	4.89		3.36	0	6	12	9	10	w.	State works.	
Mount Clemens.....	Macomb.	615	11			90	16†				3.75	+ 2.01	1.25	0	7	2	21	8	sw.	Pere Marquette R. R.	
Mount Pleasant.....	Isabella.	826	12											0	0	21	2	3	se.	Do.	
Muskegon.....	Muskegon.	587	15	69.3	+ 0.8	88	7	48	25†	30	0.50	- 1.57	0.25	0	3	24	5	2	sw.	Owosso Sugar Co.	
Old Mission.....	Grand Traverse.	858	17	66.8	+ 0.3	84*	6	46	30	37	3.81	+ 0.81	1.10	0	10	8	22	22	sw.	G. R. & I. Ry.	
Olivet.....	Eaton.	934	21	67.8	- 0.2	90	6	40	30	29	2.90	- 0.25	0.72	0	10	21	3	7	w.	E. O. Ladd.	
Onaway.....	Arenac.	616	12	68.2	+ 3.4	92	15	35	30	45	1.20	- 0.82	0.60	0	3	7	15	9	sw.	G. A. Knapp.	
Oswego Isle.....	Presque Isle.	826	8	61.8	- 1.4	98	20	31	24	34	2.94	+ 0.63	1.60	0	8	25	0	0	sw.	Pere Marquette R. R.	
Owosso.....	Shiawassee.	731	14	70.6	+ 0.6	93	9	42	29†	36	1.92	- 0.89	0.87	0	10	17	3	11	sw.	Pere Marquette R. R.	
Petroskey.....	Emmet.	660	21	64.9	- 0.2	85	7	40	30	30	1.21	- 1.72	0.40	0	9	9	18	6	sw.	Fred W. Shaw.	
Plymouth.....	Wayne.	725	14								3.00	+ 1.05	1.00	0	6	18	7	6	sw.	Pere Marquette R. R.	
Pontiac.....	Oakland.	935	11	70.0	+ 1.5	91	9	43	30	32	1.92		0.82	0	9	17	3	11	se.	Pere Marquette R. R.	
Port Austin.....	Huron.	618	14	69.2		97*	8	40	25	40	2.96		0.82	0	9	17	3	11	sw.	Pere Marquette R. R.	
Port Huron.....	St. Clair.	639	36	68.2	+ 0.9	91	7	48	30	29	2.22	- 0.41	0.75	0	10	9	13	9	n.	U. S. Weather Bureau.	
Reed City.....	Osceola.	1,033	14	68.6	+ 1.5	93	6	38	30	39	2.20	+ 0.01	0.80	0	5	7	0	24	w.	Pere Marquette R. R.	

TABLE 1.—Climatological data for August, 1911. District No. 4—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeted.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.			
<b>Ohio—Continued.</b>																				
Hudson.....	Summit.....	1,153	50	72.0	+ 2.3	99	10	43	21	5.65	+ 2.09	1.75	0	11	20	7	4	nw.	Dr. W. I. Chamberlain.	
Lima.....	Allen.....	875	12	70.6	- 0.9	96	10	51	21	6.45	+ 3.68	2.72	0	8	10	15	6	sw.	Miss Ollie De Long.	
Medina.....	Medina.....	944	23	70.4	- 0.3	97	10	43	21	6.73	+ 3.57	2.42	0	11	19	4	8	s.	F. W. Clark.	
Montpelier.....	Williams.....	880	19	70.3	+ 0.8	96	10	46	29	4.49	+ 1.64	1.47	0	6	23	3	5	w.	G. L. Laser.	
Napoleon.....	Henry.....	680	24	71.9	+ 0.8	96	10	45	30	3.13	+ 0.50	1.08	0	8	17	10	4	n.	A. C. Senter.	
New Bremen.....	Auglaize.....	1,038	18	72.1	- 0.3	100	10	48	20	5.24	+ 2.56	1.70	0	7	10	16	5	sw.	Miss Lillian Grothaus.	
North Royalton.....	Cuyahoga.....	1,000	18	70.2*	- 0.2	94*	10	45*	20	7.36	+ 3.75	2.74	0	10	13	13	5	w.	W. S. Edgerton.	
Northwalk.....	Huron.....	719	25	71.6	+ 1.1	97	10	45	21	6.20	+ 3.09	1.40	0	11	6	17	8	w.	Giles R. Gregory.	
Oberlin.....	Lorain.....	855	36	71.0	+ 1.6	96	7†	45	21	8.33	+ 5.73	3.12	0	0	11	12	4	15	sw.	Prof. F. F. Jewett.
Ottawa.....	Putnam.....	720	16	71.7	- 0.4	97	10	47	20	2.87	+ 0.17	1.48	0	7	9	16	6	sw.	Prof. J. T. Maidlow.	
Sandusky.....	Erie.....	629	34	71.8	+ 0.3	93	10	56	21	5.31	+ 1.94	2.52	0	9	10	14	7	ne.	U. S. Weather Bureau.	
Tiffin.....	Seneca.....	775	29	72.0	+ 1.1	95	10	49	30	3.44	+ 1.80	1.32	0	9	15	11	5	w.	Prof. T. H. Sonneder et al.	
Toledo (1).....	Lucas.....	769	40	71.8	+ 0.9	94	10	49	30	3.87	+ 1.17	1.89	0	10	16	9	6	sw.	U. S. Weather Bureau.	
Upper Sandusky.....	Wyandot.....	854	28	71.3	+ 0.3	98	10	46	20	5.71	+ 3.03	1.89	0	10	5	18	8	sw.	Robert E. Tracht.	
Vickery.....	Sandusky.....	588	18	72.2	+ 1.1	100	10	45	21	2.94	+ 0.16	0.77	0	8	9	14	8	sw.	John W. Barr.	
Wauseon.....	Fulton.....	780	39	70.4	+ 0.1	95	5†	45	30	4.11	+ 1.40	2.20	0	12	10	15	6	s.	Thomas Mikesell.	
Willoughby.....	Lake.....	649	17							3.97	+ 1.55	1.09	0	12	13	10	8	w.	C. M. Richardson.	
<b>Pennsylvania.</b>																				
Erie.....	Erie.....	658	38	70.0	+ 0.1	90	1	53	21	5.76	+ 2.50	1.46	0	14	6	15	10	s.	U. S. Weather Bureau.	
<b>New York.</b>																				
Adams Center.....	Jefferson.....	540	20	69.3	+ 0.5	92	1	48	20†	3.42	+ 0.64	0.81	0	11	13	14	4	w.	A. E. Cooley.	
Angelica.....	Allegany.....	1,360	28	65.6	+ 0.7	88	8†	38	20†	7.27	+ 3.20	1.97	0	18	3	16	12	w.	Charles P. Arnold.	
Appleton.....	Niagara.....	270	20	70.1	+ 2.7	97	1†	47	31	2.21	- 0.50	0.81	0	10	19	8	4	ne.	H. A. Van Wagner.	
Auburn.....	Cayuga.....	715	42	69.2	+ 0.4	92	7	47	30	3.92	+ 0.50	1.50	0	9	17	12	2	s.	A. H. Underwood.	
Avon.....	Livingston.....	585	16	69.6	+ 2.1	97	4	44	31	2.54	- 0.60	1.00	0	8	11	13	7	sw.	W. G. Markham.	
Blue Mountain Lake.....	Hamilton.....	1,750	11	71.4	+ 2.7	96	1	46	30	2.47	- 0.12	0.51	0	13	12	15	4	w.	B. F. Merwin.	
Brockport.....	Monroe.....	537	15	71.4	+ 2.7	96	1	46	30	2.47	- 0.12	0.51	0	11	13	10	8	sw.	W. H. Lennon.	
Buffalo.....	Erie.....	767	60	69.8	+ 1.0	92	1	49	30	2.61	+ 1.02	1.20	0	11	11	9	6	sw.	U. S. Weather Bureau.	
Canton.....	St. Lawrence.....	448	17	68.0	+ 1.4	93	1	39	30	2.67	- 0.02	0.56	0	11	7	13	11	sw.	Do.	
Cape Vincent.....	Jefferson.....	246	6	69.0		91	2	41	31	2.57		1.15	0	9	13	10	8	s.	Verne M. Rice.	
Carvers Falls.....	Washington.....	243	13	67.6	+ 1.5	92	3	44	20	3.53	+ 1.19	2.83	0	5	21	6	4	s.	Washburne Fancher, C. F.	
Chazy.....	Clinton.....	151	11	70.7	+ 4.3	93	1†	45	30	2.47	- 0.33	1.00	0	6	19	6	6	n.	W. R. North.	
Dannemora.....	do.....	1,490	6	68.2		92	2	44	30†	3.80		0.68	0	12	9	12	10	s.	Dr. W. N. Thayer.	
Elba.....	Genesee.....	500	12	68.3	+ 1.2	94	1	46	20	3.41	+ 1.52	0.90	0	11	18	4	9	sw.	Joseph S. Willord.	
Faust.....	Franklin.....	1,550	0							3.10	- 0.60	1.22	0	9	13	12	6	sw.	Santa Clara Lumber Co.	
Fayetteville.....	Onondaga.....	530	10	71.0	+ 2.4	95	7	45	30	3.01		1.02	0	12	13	8	10	nw.	Dana H. Wells.	
Gabriels.....	Franklin.....	1,729	9	63.4		91	2	35	30	3.07		0.68	0	9	22	6	3	sw.	Gabriel's Sanitarium.	
Harkness.....	Clinton.....	622	9	68.6	+ 3.0	94	1	41	31	2.60	+ 0.38	0.68	0	8	22	3	6	sw.	J. W. Harkness.	
Hemlock Lake.....	Livingston.....	900	13	69.2	+ 0.7	89	8	45	30†	4.09	+ 1.30	1.75	0	8	11	6	14	s.	D. H. Westbury.	
Hunt.....	do.....	1,321	12	68.3	+ 0.8	92	1†	43	20	3.49	+ 2.13	1.75	0	8	19	7	10	sw.	W. S. Barager.	
Ithaca.....	Tompkins.....	928	33	68.8	+ 0.6	94	10	45	21	3.45	+ 0.91	1.72	0	12	6	11	14	se.	U. S. Weather Bureau.	
Keene Valley.....	Essex.....	1,000	13	67.2	+ 3.0	95	2	39	31	1.94	- 1.69	0.92	0	8	14	11	6	w.	E. R. Wells.	
King Ferry.....	Cayuga.....	11								3.36	- 0.04	1.33	0	9	10	13	8	se.	Lucius A. Goodyear.	
Lake George.....	Warren.....	350	14	67.2	+ 0.5	89	6†	46	22	4.54	+ 0.42	1.92	0	12	14	10	7	sw.	Charles Forsell.	
Lake Placid Club.....	Essex.....	1,864	3	61.8		89	1	36	21	3.04		0.79	0	11	14	14	3	sw.	Henry von Hoevenberg.	
Le Roy.....	Genesee.....	920	21	68.7	+ 1.4	90	1	44	30†	3.37	+ 0.28	0.70	0	13	13	2	16	se.	F. W. Ball.	
Lockport.....	Niagara.....	650	24	68.1	+ 0.7	92	1	44	30	2.86	+ 0.34	0.82	0	11	16	5	10	sw.	J. E. Wakeman.	
Lowville.....	Lewis.....	900	44	65.8	+ 0.9	92	1	40	31	3.86	+ 0.64	0.90	0	9	15	10	6	w.	Charles J. Rice.	
Moira.....	Franklin.....	200	11	69.8	+ 3.5	99	1	40	30†	6.24	+ 2.99	2.39	0	12	16	12	3	w.	C. E. McBride.	
Nehasane.....	Herkimer.....	1,750	3	62.8		89	1†	35	21	4.00		0.74	0	13	13	14	4	w.	L. W. Brown.	
North Lake.....	do.....	1,822	10							3.10	- 0.60	1.22	0	8	12	19	0	se.	John F. Redmond.	
Ogdensburg.....	St. Lawrence.....	175	27	71.6	+ 4.1	98	2	45	30	3.75	- 0.26	0.82	0	8	12	19	0	se.	State Hospital.	
Oldforge.....	Herkimer.....	1,733	3	63.0		89	1	36	21	3.75	- 0.20	0.70	0	17	11	10	10	w.	Mrs. S. W. Nelson.	
Oswego.....	Oswego.....	335	41	69.0	+ 0.2	90	1	51	30	2.36	+ 1.17	1.34	0	11	7	12	12	s.	U. S. Weather Bureau.	
Otto.....	Cattaraugus.....	1,410	7	67.2		87	1†	45	12†	3.20		1.60	0	15	15	12	4	sw.	William J. Wienk.	
Palermo.....	Oswego.....	460	52							3.11	+ 0.26	1.03	0	12	21	5	5	s.	E. B. Bartlett.	
Perry City.....	Schuylerville.....	1,038	31	65.8	- 0.3	88	1†	41	21	3.15	+ 1.54	1.42	0	12	7	8	16	nw.	W. H. Jeffers.	
Philadelphia.....	Jefferson.....	455	5	69.0		92	1	42	30†	3.51		0.86	0	16	8	19	4	w.	E. D. Babcock.	
Potsdam.....	St. Lawrence.....	335	5	71.0	+ 4.6	98	2	41	30	4.26	+ 0.86	1.22	0	11	12	9	10	w.	A. E. Sutherland.	
Raquette Lake.....	Hamilton.....	3	3	63.2		87	1	41	26	3.75		0.98	0	11	12	9	10	w.	R. J. Dunning.	
Rochester.....	Monroe.....	523	82	70.4	+ 2.1	94	1	50	20	4.29	+ 1.33	2.55	0	11	6	13	12	sw.	U. S. Weather Bureau.	
Romulus.....	Seneca.....	719	19	69.5	+ 1.5	91	8	48	30†	3.94	+ 1.15	1.18	0	9	14	12	5	nw.	John H. Coryell.	
Shortsville.....	Ontario.....	740	12	69.5	+ 1.5	91	8	48	30†	3.99	+ 0.26	1.03	0	9	14	12	5	w.	C. H. Latting.	
Skaneateles.....	Oneida.....	16								3.49	+ 0.26	1.03	0	9	10	6	13	12	s.	Edward Conron.
Syracuse.....	do.....	597	9	69.3	+ 0.7	89	1	48	30	2.45	- 0.88	1.35	0	10	6	13	12	s.	U. S. Weather Bureau.	
Ticonder																				

TABLE 2.—*Daily precipitation for August, 1911. District No. 4, Lake region.*

TABLE 2.—*Daily precipitation for August, 1911. District No. 4—Continued.*

Stations.	Watershed.	Day of month.																														Total.		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
<i>Lower Michigan—Continued.</i>																																		
Big Rapids	Muskegon	.38																																1.37
Bloomingdale	Lake	.41																																3.48
Cadillac	Manistee	.20	.10																														2.05	
Cassopolis	St. Joseph																																0.86	
Charlevoix	Lake	.92																															3.69	
Charlotte	Kalamazoo	.12																															2.23	
Cheboygan	Cheboygan	.50																															3.60	
Clinton	Raisin	.75																															2.90	
Coldwater	St. Joseph	.10																															3.42	
Concord	Kalamazoo	.43																															4.70	
Croton	Muskegon	.25	.01	.07	T.																											1.27		
Detroit	Detroit	.28	.01	.28	T.																											1.31		
Durand	Saginaw																																	
East Tawas	Lake	.10		.25		.35																										2.32		
Eloise	Rouge	.24		.15		.23	.24																									1.82		
Flint	Saginaw	.20		.05	.10																											3.03		
Frankfort	Betsey	.15																														2.05		
Ganges	Lake	.50		.05			.17																									3.39		
Gaylord	Cheboygan																																	
Gladwin	Saginaw	1.10																															5.50	
Grand Haven	Grand	.29		T.		T.																											1.20	
Grand Rapids	do	.80	.01	.19																													2.29	
Grape	Raisin	.58		.05	T.																												2.56	
Grass Lake	Grand	.61																															2.24	
Grayling	Au Sable	.07																															1.64	
Harbor Beach	Lake	.12		.25	.35																											2.97		
Harrison	Saginaw																																	
Harrisville	Lake	.10	.14	T.		.04	T.	.10	.97	.10																						2.49		
Hart	Pentwater	.10																															1.95	
Hayes	Pigeon	.65	.23	.03																													3.91	
Highland	Huron	.60																															1.30	
Hillsdale	St. Joseph	.65		.02																													4.14	
Holland	Lake	.39																															1.79	
Howell	Saginaw	.33		.05																													3.43	
Ivan	Manistee	.18	.03																														0.07	
Jackson	Grand	.40																															2.44	
Jeddo	St. Clair	.30		T.		T.																											1.88	
Kalamazoo	Kalamazoo	.10																																3.08
Lansing (Agr. Col.)	Grand	.30	.04																														1.43	
Lansing (Capitol)	do	.11	.08																														1.69	
Lapeer	Saginaw	.32		.06	.03	.04																										2.51		
Ludington	Pere Marquette	.46																															3.27	
Luther	Manistee	.73	.11																														3.24	
Mackinaw	Lake	.80																															2.07	
Mancelona	do	.20		.10		T.		T.																								0.89		
Manistee	Manistee	.15																														0.06		
Midland	Saginaw	.50		T.																												1.10		
Morenci	Maumee																															4.89		
Mount Clemens	Clinton	.25	1.23	T.		T.																										3.75		
Mount Pleasant	Saginaw																																	
Muskegon	Muskegon																																0.50	
Old Mission	Lake	.67																														3.81		
Olivet	Kalamazoo	.72																														2.90		
Omer	Lake	.60																														1.20		
Onaway	Cheboygan																																	
Owosso	Saginaw	.29		.01		.10																										2.94		
Petoskey	Lake	.40																														1.21		
Plymouth	Kouge	.50	T.																													3.00		
Pontiac	Clinton	.60	1.22	.13																												1.92		
Port Austin	Lake	.47	.22																													2.96		
Port Huron	St. Clair	.09		.60																												2.22		
Reed City	Muskegon	.30		T.																												2.20		
Roscommon	Au Sable																															0.4		
Saginaw	do	.10																														2.75		
Saginaw, West Side	do	.17	.10	T.																														

TABLE 2.—*Daily precipitation for August, 1911. District No. 4—Continued.*

\* Precipitation included in that of the next measurement

<sup>†</sup> Separate dates of falls not recorded.

Precipitation for the 24 hours ending on the morning when it is measured.

T. Precipitation is less than 0.01 inch rain or melted snow.

TABLE 3.—Maximum and minimum temperatures at selected stations for August, 1911. District No. 4, Lake region.

Date.	Duluth, Minn.		Wisconsin.						Chicago, Ill.		Fort Wayne, Ind.		Upper Michigan.						Lower Michigan.										
			Florence.		Green Bay.		Milwaukee.						Escanaba.		Ewen.		Houghton.		Marquette.		Sault Ste. Marie.		Alpena.		Battle Creek.		Cadillac.		
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
1....	63	52	76	60	78	61	82	50	84	65	80	69	71	61	83	52	73	57	79	58	78	63	74	65	85	67	76	68	
2....	75	52	71	52	72	55	75	61	71	66	80	66	69	54	73	57	70	53	68	54	74	55	78	60	79	64	73	61	
3....	66	51	74	47	70	54	70	58	75	65	84	63	68	54	78	45	70	53	64	54	75	52	73	56	85	58	76	56	
4....	60	51	78	54	83	60	80	63	88	70	84	67	71	63	76	45	69	53	74	55	80	60	74	60	86	63	79	60	
5....	76	54	80	56	83	62	8	68	80	70	88	70	76	60	77	50	74	56	82	61	83	61	84	61	91	63	85	64	
6....	72	58	78	54	81	64	78	68	81	71	92	67	78	59	79	56	79	56	72	60	78	57	77	60	93	64	87	69	
7....	64	52	76	61	85	66	90	65	92	74	87	70	71	64	76	55	85	52	70	57	76	62	73	60	90	67	88	64	
8....	74	55	78	58	81	62	83	64	88	78	84	66	77	60	77	50	76	55	75	59	65	74	61	87	67	80	62		
9....	73	58	76	62	85	65	89	61	90	70	91	62	81	62	78	45	72	57	74	56	72	52	90	56	91	56	83	57	
10....	60	50	66	49	66	57	79	58	89	69	97	66	68	55	77	50	60	51	62	52	68	49	69	54	93	61	72	60	
11....	68	50	74	49	72	54	67	58	72	64	85	66	72	51	72	50	74	51	67	50	69	51	75	55	87	63	74	57	
12....	69	53	76	47	77	59	69	63	75	65	77	60	70	57	75	44	77	50	78	53	75	45	72	48	71	57	79	55	
13....	73	57	83	50	82	58	69	63	74	68	85	68	72	57	80	52	81	59	86	63	81	48	78	52	73	60	81	57	
14....	80	60	79	58	77	61	82	64	90	72	89	69	72	62	75	60	82	63	83	57	82	57	86	65	86	58	83	57	
15....	85	64	86	60	90	63	83	67	77	69	84	68	77	62	74	58	85	68	78	62	71	61	85	63	86	62	84	63	
16....	81	60	79	62	84	66	89	70	92	72	90	62	76	63	85	55	76	60	72	63	77	58	79	63	85	65	86	67	
17....	74	52	74	55	80	62	86	66	80	73	83	68	78	58	77	52	69	57	70	62	71	56	82	64	83	63	80	58	
18....	67	50	69	51	72	55	72	63	75	68	80	61	68	50	70	58	65	54	63	53	64	52	74	61	80	61	72	55	
19....	76	54	73	39	74	52	70	59	70	66	73	54	69	49	75	39	71	50	67	52	66	50	72	48	75	49	71	46	
20....	84	58	80	50	80	55	75	62	73	62	77	53	73	53	72	46	77	50	73	59	75	46	75	49	86	50	70	48	
21....	74	51	74	53	82	62	82	60	84	65	82	52	55	72	62	71	48	70	59	72	58	75	55	81	52	79	47		
22....	65	44	65	47	66	54	72	58	72	63	79	59	64	51	70	46	71	53	64	53	70	53	79	58	74	56	80	56	
23....	69	44	68	40	71	49	68	54	66	62	62	59	59	68	46	73	48	66	48	64	49	63	46	70	46	71	55	69	43
24....	69	50	81	39	72	52	70	59	65	59	62	54	66	48	70	42	71	53	73	52	73	41	70	44	66	54	73	42	
25....	75	48	.....	74	53	69	56	68	61	70	56	68	54	74	39	76	57	76	55	70	48	69	50	73	54	72	52		
26....	60	50	76	52	80	58	74	60	74	62	76	54	70	55	72	42	68	55	77	56	77	52	73	51	80	59	78	57	
27....	61	48	76	55	80	60	84	61	85	65	84	65	80	59	70	52	71	57	80	57	79	61	82	61	83	60	80	58	
28....	63	44	59	47	64	50	70	54	76	62	73	54	63	46	73	48	57	49	60	47	62	50	71	51	73	60	80	57	
29....	61	42	63	37	64	45	65	50	64	60	67	49	60	43	66	55	61	41	49	55	45	56	44	61	44	70	45	63	43
30....	56	49	62	41	67	47	66	59	67	59	71	47	61	51	65	56	40	62	47	61	45	64	40	64	40	72	41	69	44
31....	79	47	74	41	74	50	79	54	75	60	80	60	78	52	72	57	.....	70	53	74	52	63	52	68	55	79	50	73	53
Mns..	70.1	51.9	74.1 <sup>a</sup>	51.3 <sup>a</sup>	76.5	57.3	76.2	60.9	77.6	66.0	80.5	61.3	71.0	55.7	73.0 <sup>b</sup>	48.4 <sup>b</sup>	70.9	54.5	71.3	55.5	71.8	52.7	74.4	54.6	81.2	58.5	77.3	56.2	

Date.	Lower Michigan.						Ohio.						Eric, Pa.						New York.						Vermont.					
	Detroit.		Muskegon.		Saginaw West Side.		Cleveland.		Lima.		Sandusky.		Toledo.		Buffalo.		Canton.		Rochester.		Syracuse.		Burlington.		Northfield.					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
1....	84	68	78	70	84	69	88	69	82	67	88	68	82	69	90	72	92	75	93	2	94	71	89	69	92	63	88	55		
2....	83	69	75	64	83	71	81	64	83	69	85	69	86	71	86	70	89	69	88	73	89	72	92	67	83	60	90	56		
3....	73	67	77	58	82	61	79	68	83	66	76	67	74	66	79	70	83	70	85	68	85	71	80	68	86	68	90	59		
4....	84	65	78	62	87	59	81	77	82	68	86	66	83	68	82	70	87	71	88	72	87	76	86	68	80	59	83	57		
5....	89	70	84	64	93	63	82	68	93	68	90	68	82	69	87	70	86	67	86	70	84	71	89	66	84	56	84	56		
6....	88	69	85	60	95	65	86	70	89	69	80	65	87	69	89	65	87	71	89	61	89	69	87	63	85	58	84	58		
7....	89	71	88	67	92	64	89	69	87	67	88	69	90	71	87	69	90	68	89	66	88	64	89	65	86	58	81	61		
8....	84	69	82	67	81	67	81	70	88	71	87	73	87	70	81	70	82	68	87	70	90	66	82	61	80					